

**Amendment to Final Remedial Action Plan
Oakland Army Base
Oakland, California
for
Subaru Lot, Former Parcels 6 and 7
Heroic War Dead
United States Army Reserve Center**

Prepared for

**Department of Toxic Substances Control
California Environmental Protection Agency**

Prepared by

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(EKI A10063.01)

29 July 2004

RAP AMENDMENT

Subaru Lot, Former Parcels 6 and 7
Heroic War Dead United States Army Reserve Center, Oakland, California

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LIST OF ABBREVIATIONS AND ACRONYMS

ACE	United States Army Corps of Engineers
ASI	Automotive Services Incorporated
ARARs	Applicable or Relevant and Appropriate Requirements
Army	United States Department of Defense, Department of the Army
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
CERCLA	Comprehensive Environmental Responsibility, Compensation, and Liability Act
C.F.R.	Code of Federal Regulations
cm/s	centimeters per second
COC	chemical of concern
DTSC	California Environmental Protection Agency, Department of Toxic Substances Control
EDC	Economic Development Conveyance
EIR	Environmental Impact Report
EKI	Erler & Kalinowski, Inc.
FOST	Finding of Suitability for Transfer
mg/kg	milligrams per kilogram
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
OARB	Oakland Army Base
OBRA	Oakland Base Reuse Authority
PCBs	polychlorinated biphenyls
Port	Port of Oakland
RAO	Remedial Action Objective

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LIST OF ABBREVIATIONS AND ACRONYMS

RAP	Remedial Action Plan
RMP	Risk Management Plan
RWQCB	Regional Water Quality Control Board, San Francisco Bay Region
SPTCo	Southern Pacific Transportation Company
TPH	total petroleum hydrocarbons
TPHd	TPH quantified as diesel
TPHg	TPH quantified as gasoline
TPHk	TPH quantified as kerosene
USAR	United States Army Reserve
U.S. EPA	United States Environmental Protection Agency
WRA	Wetlands Research Associates, Inc.

1. EXECUTIVE SUMMARY

1.1 PURPOSE

This *Amendment to Final Remedial Action Plan, Oakland Army Base, Oakland, California For Subaru Lot, Former Parcels 6 and 7 Heroic War Dead United States Army Reserve Center* (“Subaru Lot RAP Amendment” or “RAP Amendment”) amends the California Environmental Protection Agency, Department of Toxic Substances Control (“DTSC”)-approved *Final Remedial Action Plan Oakland Army Base, Oakland, California*, dated 27 September 2002 (“RAP”) prepared by Erler & Kalinowski, Inc. (“EKI”) (2002a) (“DTSC-approved RAP”) and to include former Parcels 6 and 7, known as the Subaru Lot, (“Site”) in the area to which the DTSC-approved RAP applies. This RAP Amendment further identifies, evaluates, and proposes remedies for the Subaru Lot.

1.2 RATIONALE FOR AN AMENDMENT

The Site shares similar past uses and are contiguous to the Former Oakland Army Base – Economic Development Conveyance Area (“Former OARB – EDC Area”) covered by the DTSC-approved RAP. The Site also has similar types of potential chemicals of concern (“COCs”) as the Former OARB-EDC Area. An amendment to the DTSC-approved RAP is a convenient and efficient method for selecting remedies that are protective of human health and the environment and are consistent with the Oakland Base Redevelopment Agency (“OBRA”) Reuse Plan (OBRA, 2001).

1.3 SITE LOCATION, CONDITION, AND INTENDED REUSE

Former Parcels 6 and 7 currently consist of 19.032 acres of paved parking and unimproved land owned by the United States Army Reserve (“USAR”) located adjacent to the former Oakland Army Base (“OARB”) in Oakland, California (Figures 1 and 2).

1.3.1 Site Use History

The Site was historically natural tidal marsh or open water until the United States Department of the Army (“Army”) acquired the land in 1941 and filled the Site to achieve the final grade. Historical uses of the Site by the Army and tenants included salvaging of wood and metal, open storage of vehicles and other materials, a lumber mill, automobile spraying and washing using a water based asphalt emulsion and kerosene wash, drum storage, and vehicle servicing (EKI, 2003d). Several unidentifiable debris

piles and stained areas resulting from the Army's on-Site activities were observed in historic aerial photographs taken in 1949, 1957, and 1968 (EKI, 2003d). Approximate locations of historic stained areas and historic debris piles as observed in these photos are depicted on Figure 2.

In the early 1990s, the Port of Oakland ("Port") placed approximately 30,000 cubic yards of soil, identified as intended "fill material" for Berths 8 and 9, onto former Parcel 6 (Port, 1992, 1995; United States Army Corps of Engineers ["ACE"], 1995). In 1995, the Base Realignment and Closure Commission determined that the former OARB was to be closed. Pursuant to the base closure process, former Parcels 6 and 7 were assigned to the USAR in 1998. Since 1998, the USAR has used the site for military equipment parking and privately owned vehicle parking.

1.3.2 Nature and Extent of Chemical Impacts

Several phases of investigations were conducted on the Site on behalf of the Army's tenants in the early 1990's. Additionally, OBRA conducted a screening-level Phase II environmental site assessment in 2003. Based on the results of site assessments and environmental investigations by OBRA and the Army's previous tenants, residual contamination of soil and groundwater on the Site is relatively minor.

The remaining detected maximum COC concentrations in soil are 1,700 milligrams per kilogram ("mg/kg") for kerosene and diesel, 9.2 mg/kg for arsenic, 160 mg/kg for lead, and polychlorinated biphenyls Aroclor-1260 at 0.76 mg/kg. The maximum COC concentrations in groundwater are 1,000 microgram per liter ("µg/L") for kerosene, 1,000 µg/L for diesel, 15 µg/L for arsenic, and 2,300 µg/L for manganese. These COC concentrations are less than the risk-based Remediation Goals for the Site established in Section 7 of this RAP Amendment, where established. Such risk-based Remediation Goals are based on an industrial / commercial land use scenario with the same exposure parameters as provided in the DTSC-approved RAP. Some COC concentrations are greater than screening levels for unrestricted land use.

1.3.3 Intended Reuse

Redevelopment of the Site is anticipated to be for commercial and industrial uses, consistent with OBRA's Reuse Plan (OBRA, 2001).

1.4 IDENTIFICATION, SCREENING, AND SELECTION OF REMEDIAL ALTERNATIVES

The remedial alternatives are identified, screened, and selected in Section 8 of this RAP Amendment. The identified remedial alternatives include:

No Action Alternative:

- No action for soil and groundwater.

Action Alternatives:

- Conduct a Remedial Investigation and prepare a separate Remedial Action Plan including an evaluation of its own remedial action objectives (“RAOs”), remediation goals, and remedial alternatives.
- Amend the existing DTSC-approved RAP and evaluate the remedial alternatives retained for detailed analysis.

Pursuant to the rationale provided in Section 1.2, above, the only alternative retained for detailed analysis was amendment to the existing DTSC-approved RAP. Under this alternative, each individual remedial alternative from the DTSC-approved RAP was subject to the analysis described in Section 8. On the basis of the detailed analysis, use of institutional controls was the selected alternative.

1.5 SELECTED REMEDY

As presented in Section 8, the proposed remedy for the contamination at the Site is amending the existing DTSC-approved RAP to include the Site in the DTSC-approved RAP, and then selecting an appropriate remedy from among those identified in the DTSC-approved RAP. The appropriate remedy proposed for the Site is institutional controls, which will be in the form of a Covenant to Restrict Use of Property – Environmental Restriction (“Covenant”). The Covenant will include the following environmental restrictions and Implementation and Enforcement Plan requirements:

1.5.1 Environmental Restrictions

- Sensitive land uses, including, but not limited to, residential housing, schools for persons under 18 years of age, day-care facilities for children, hospitals, and

hospices are prohibited. Reuse of Site soil outside of the Site boundary for any purpose is permitted only with the written approval of DTSC.

- The construction of groundwater wells and extraction of groundwater from new and/or existing wells for any purpose are permitted only with the written approval of DTSC. Construction dewatering activities are permitted subject to all applicable local and State requirements, including those of the California Regional Water Quality Control Board, for disposing of the liquid from dewatering activities.

1.5.2 Implementation and Enforcement Plan

All current and successive property owners shall comply with the Implementation and Enforcement Plan which includes the following requirements:

- A written report shall be submitted to DTSC annually. The report submittal date shall be within thirty (30) days following the anniversary date of the initial property transfer. The report shall include: (1) inspection results, (2) a certification attesting to the compliance of the terms and conditions of the Covenant, and (3) a discussion on any dewatering activities and final disposition of the liquid, violations of the Covenant, and any action taken to ensure compliance with the Covenant.
- DTSC shall be provided with reasonable right of entry and access to the property for periodic inspections to ensure compliance with the Covenant.

The remaining detected maximum COC concentrations in soil and groundwater are below the Remediation Goals established for industrial / commercial land use; however, some of the remaining detected concentrations are not protective for unrestricted land use by sensitive populations. By requiring environmental restrictions and an Implementation and Enforcement Plan, the institutional controls selected in this RAP Amendment will be protective of human health and the environment under an industrial / commercial land use scenario.

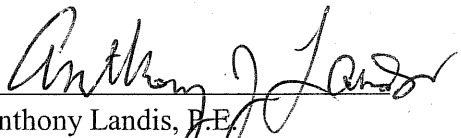
On the basis of the results of OBRA's Phase II Investigation, previous implementation of active remediation by prior tenants of the Army, and consultation with DTSC, implementation of the Risk Management Plan (EKI, 2002b) ("RMP"), which is Appendix E of the DTSC-approved RAP, is not part of the selected remedy.

Once DTSC approves this RAP Amendment, the Army will implement the remedy selected in this RAP Amendment through execution and recordation of the Covenant identified in Section 8. The Covenant will be executed and recorded as part of the transfer of the Site. It is intended that the selected remedy, institutional controls in the form of the Covenant, be the final remedy for the Site. Upon implementation of the final remedy, DTSC will determine whether all necessary remediation at the Site has been completed. Once that determination is made, DTSC will issue a certification letter to the Army concurring that the Army has completed all remediation on the Site. At that time, DTSC anticipates being able to concur with the Finding of Suitability for Transfer ("FOST"). The Army uses the FOST to document that all required remediation or other remedies have been implemented prior to transfer.

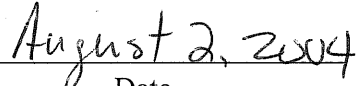
The Covenant will be recorded in the Alameda County Assessor's Office, run with the land, bind all owners of the land, their heirs, successors, and assignees, and the agents, employees, lessees, or renters of the owners, heirs, successors, and assignees. The Covenant will continue in perpetuity unless modified or terminated in accordance with applicable law.

1.6 DECLARATION / STATUTORY DETERMINATION

This RAP Amendment is prepared pursuant to the California Health and Safety Code, section 25350 and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 C.F.R. 300.400 et seq.). The selected remedy for the Site is intended to be protective of human health and the environment. The selected remedy complies with federal and state requirements that are legally applicable or relevant and appropriate to the remedial actions and is cost effective. DTSC hereby approves this RAP Amendment in accordance with California Health and Safety Code, section 25356.1(b).



Anthony Landis, P.E.
Chief, Northern California Operations
Office of Military Facilities
Department of Toxic Substances Control
California Environmental Protection Agency



Date

2. INTRODUCTION

2.1 PURPOSE

This RAP Amendment amends the DTSC-approved RAP to include the Site in the area covered by the DTSC-approved RAP. This RAP Amendment further identifies, evaluates, and proposes remedies for the Site.

2.2 RATIONALE FOR AN AMENDMENT

The Site shares similar past uses and is contiguous to the Former OARB – EDC Area covered by the DTSC-approved RAP. The Site also has similar types of COCs as the Former OARB - EDC Area. An amendment to the DTSC-approved RAP is a convenient and efficient method for selecting remedies that are protective of human health and the environment and are consistent with the OBRA Reuse Plan (OBRA, 2001).

2.3 SITE LOCATION AND DESCRIPTION

The Site currently consists of 19.032 acres of paved parking and unimproved land owned by the USAR contiguous to the former OARB in Oakland, California (Figures 1 and 2).

2.4 INTENDED REUSE

Redevelopment of the Site is anticipated to be for commercial and industrial uses, consistent with OBRA's Reuse Plan (OBRA, 2001).

3. SITE BACKGROUND

This section provides a summary of background information on the Site. A detailed description of the regional setting of the former OARB, which included the Site, is described in the DTSC-approved Remedial Action Plan. The Site is not part of, but is contiguous to, the Former OARB - EDC Area.

3.1 SITE SETTING AND FEATURES

The Site consists of 19.032 acres of paved parking and unimproved land on the southeastern portion of the Heroic War Dead United States Army Reserve Center in Oakland, California. The Site is bordered on the south by West Grand Avenue, on the northwest by Wake Avenue, and on the north by the East Bay Municipal Utilities District sewage treatment plant (Figure 2).

The only structures currently on the Site are utility poles, light poles, fire hydrants, storm drain catch basins, chain link fencing, and one pad-mounted transformer located along the northern boundary of the Site. Sampling of the oil in this transformer by the Army indicated that polychlorinated biphenyls (“PCBs”) were not detected in the transformer above laboratory detection limits of 1 to 2 mg/kg (*Preliminary PCB Inventory Data Collection, Transformer 87-51159*, dated 15 April 1994, provided by Oakland Army Base Transition Office). The eastern portion of the Site, i.e., former Parcel 7, is largely paved. The western portion of the Site, i.e., former Parcel 6, is unpaved.

Two large soil stockpiles covered with grass and other vegetation are present on former Parcel 6. The soil stockpiles were observed to contain some debris, such as broken concrete, rocks, metal, and plastic pipe. On 20 April 2004, the USAR issued a license to OBRA to conduct earth moving training and other grading activities on the Site. The soil stockpiles on former Parcel 6 will be partially graded and left on-Site as part of these activities.

3.2 SITE GEOLOGY

Much of the area encompassing the Former OARB – EDC Area and the Site was natural tidal marsh or shallow open water before 1916 (Kleinfelder, 1998). Filling occurred in subsequent years to construct land to create the former OARB. The soil encountered beneath the Site generally consists of silty to clayey gravel and sandy clay from the ground surface to a depth of approximately 6 feet below ground surface (“bgs”) (Industrial Compliance, 1993; EKI, 2003d). The gravel and clay in the upper 6 feet is

most likely fill imported by the Army during construction of the former OARB, in 1941 and 1942, that was used to cover the former mud flats on the margin of the San Francisco Bay. The soils below 6 feet bgs generally consist of a gray to brown sand unit, locally known as bay sand, interbedded with a highly organic, dark gray to black clay, locally known as bay mud (Industrial Compliance, 1993).

3.3 SITE HYDROGEOLOGY

The Site is located approximately 0.4 miles south of the San Francisco Bay. Groundwater is generally encountered at depths ranging from 4 to 7 feet bgs (Industrial Compliance, 1993; EKI, 2003d). The local hydraulic gradient in the center of former Parcel 7, as measured in August 1993 by consultants for Southern Pacific Transportation Company (“SPTCo”), was approximately 0.003 feet per foot in the southerly direction (Industrial Compliance, 1993). However, because groundwater flow direction is affected locally by natural heterogeneous conditions, by manmade preferential flow paths such as storm drains or high permeability fill materials extending beneath the water table, by infiltration from seasonal irrigation, rain, broken sewers and storm drain lines, and by tidal influence, groundwater flow direction at the Site is generally toward San Francisco Bay, i.e., to the northwest.

Beginning at a depth of approximately 15 feet bgs, a sequence of clay on the order of 10 feet thick, referred to as Young Bay Mud, underlies the shallow water-bearing zone at the former OARB, where the Site is located (IT, 2000b). The Young Bay Mud is not very permeable. The ACE and the Port (Port, 2000) stated in the Environmental Impact Report (“EIR”) for proposed dredging of Oakland Harbor that the Young Bay Mud is an aquitard with a low permeability of 1×10^{-7} centimeters per second (“cm/s”). The Young Bay Mud restricts downward movement of groundwater to the next deeper water-bearing zone that is located at a depth of approximately 25 feet bgs. This deeper water-bearing zone is referred to as the Merritt Sand, which is the uppermost member of the San Antonio Formation (Kleinfelder, 1998). The former OARB lies in the East Bay Plain groundwater basin.

3.3.1 Groundwater Quality

As discussed in more detail in the DTSC-approved RAP prepared for the Former OARB - EDC Area, groundwater at the former OARB, where the Site is located, in both the shallow water-bearing zone and Merritt Sand, is of poor quality due to the proximity to San Francisco Bay. The Regional Water Quality Control Board, San Francisco Bay Region (“RWQCB”) recognizes the poor quality of groundwater near the former OARB and has proposed a formal determination that groundwater along the Oakland shoreline,

including the former OARB, cannot be used for drinking water supply (RWQCB, 1999, 2000).

3.3.2 Potential for Contaminant Migration to San Francisco Bay Via Groundwater

Groundwater sampling data collected by EKI during the Phase II Investigation of the Site indicates that shallow groundwater at the Site is not significantly impacted by prior releases from historic uses of the property (EKI, 2003d). Additionally, any COCs in groundwater, if present, are most likely not migrating to San Francisco Bay because the groundwater velocity at the former OARB is low compared with the rate of sorption and degradation mechanisms (Kleinfelder, 1998). Seawalls constructed along portions of the Port harbor facilities affect movement of groundwater and serve as barriers to lateral groundwater flow, and tidal influence studies indicate that the actual exchange of water from the shallow water-bearing zone and San Francisco Bay is minimal (Kleinfelder, 1998).

Although the movement of contaminants in groundwater through the shallow water-bearing zone appears restricted and subject to natural attenuation at the former OARB, as discussed in Section 3.5.2 of the DTSC-approved RAP, it is possible that groundwater migrates to San Francisco Bay through the sand or gravel bedding that surrounds storm drains or through storm drain piping. Storm drain piping at the former OARB is often situated in the saturated zone, and groundwater may enter the cracked or otherwise breached storm drain piping. Based on the available information reviewed by EKI, the storm drain system on former Parcels 6 and 7 has been inspected, and no damaged lines or internal sediment contamination were found (Earth Tech, 2000). Groundwater from the Site that may enter the storm drains is not significantly contaminated based on the results of OBRA's Phase II Investigation and the apparent effectiveness of prior remediation efforts by others (See Section 4.1).

3.4 SITE NATURAL RESOURCES

According to natural resource evaluations conducted on behalf of the USAR, low lying areas exhibiting areas of cracked mud existed around the stockpiled soil mounds on former Parcel 6 (USAR, 2002, 2003a, 2003b). These evaluations reported that these areas, observed during the dry season, potentially held water during the rainy season and concluded that they could potentially be wetlands, but further evaluation was required. Subsequent evaluations conducted by Wetlands Research Associates, Inc. ("WRA") on behalf of OBRA indicated that there are no wetland areas subject to federal jurisdiction (WRA, 2003). The ACE also concluded that the area was not subject to federal jurisdiction. (ACE, 2004). The low value isolated wetland features will be removed,

when OBRA, under license from the USAR, and consistent with an offset program approved by the RWQCB, commences its equipment training program and grading activities.

Species of lizards, birds, and both native and non-native plant species have been observed on the Site during environmental assessments (USAR, 2003a, 2003b). However, no sensitive or endangered plant or animal species have been identified on-Site during any of the previous investigations. The natural resource evaluations recommended that additional surveys be conducted for the alkali milkvetch, (*Astragalus tener* var. *tener*) a rare plant species in California, and for the burrowing owl, a potential inhabitant of the Site. Subsequent investigations by the USAR have concluded that the alkali milkvetch and the burrowing owl are not present on-Site (USAR, 2003a, 2003b).

A consultant to the USAR concluded that the only special-status species that may exist on-Site is the round-leaf filaree (*Erodium macrophyllum*), which is included on the California Native Plant Society List 2 (Plants rare, threatened or endangered in California, but more common elsewhere) (USAR, 2003a, 2003b). During a field visit by OBRA's consultant, WRA, in November 2003, no round-leaf filaree were found on-Site (WRA, 2003). WRA concluded that it was highly unlikely that the plant species would exist on-Site because the Site does not provide suitable habitat to establish a sustainable population of this species. Further, the WRA report notes that round-leaf filaree has no official federal or state status as a threatened or endangered species (WRA, 2003).

3.5 SITE USE HISTORY

Much of the former OARB, including the Site, was natural tidal marsh or open water before 1916. During the first half of the 1900s, dredged sand and imported soil were placed to create the land surface. The Army acquired the land in 1941, and provided additional fill in most portions of the former OARB, including the Site, to achieve the final grade.

Between the 1940s and the mid-1970s, the Site was used by the Army for salvaging of wood and metal and open storage of vehicles and other material (EKI, 2003a). The western portion of the Site, i.e., former Parcel 6, also contained a small lumber mill. Two rail spurs were constructed on the Site around 1947.

In 1979, the Army leased the Site to SPTCo, which in turn subleased former Parcel 7 to Automotive Services Incorporated ("ASI") from 1981 through 1989 (SP Environmental Systems, Inc., 1991). SPTCo also subleased former Parcel 6 to a trucking company as described in a site assessment report of the former OARB prepared by the United States

Army Toxic and Hazardous Materials Agency (1988). Activities conducted by tenants on the Site during this time period included automobile spraying and washing using various chemicals (i.e., water based asphalt emulsion and kerosene wash), drum storage by ASI, and vehicle servicing on former Parcel 6 by a truck company.

In the early 1990s, the Port reportedly stockpiled approximately 30,000 cubic yards of soil, identified as intended “fill material” for Berths 8 and 9, onto former Parcel 6 (Port, 1992, 1995; ACE, 1995). The stockpiles reportedly consisted of upland soil removed from the Berth 30 shoreline. Sampling of the “fill material” by the Port prior to delivery to the Site indicated that soil from one area had elevated lead concentrations. However, documentation referred by the Port of Oakland during the public comment period for this RAP Amendment suggests that sampling of the “fill material” stockpiled at Parcel 6 contained lead with concentrations that ranged from 5 to 28 mg/kg (Clayton, 1996). To assess whether the stockpiles are impacted with lead, EKI characterized the stockpiles in 2003 as part of the Phase II investigations on behalf of OBRA (EKI, 2003d) (See Section 4.3 below).

In 1998, the USAR acquired the site through the Base Realignment and Closure process. Since that time, the USAR has used the site for military equipment parking and privately owned vehicle parking.

A more detailed description of the Site use history from the 1940s through 2003 is provided in the *Parcels 6 and 7 Phase II Investigation Work Plan, Oakland Army Base, Oakland, California* (“Work Plan”; EKI, 2003a). Information on the recent environmental sampling activities on behalf of OBRA is provided in the Work Plan, associated Work Plan Addendums (“Work Plan Addendums” EKI, 2003b, 2003c), and the *Phase II Investigation Report, Former Parcels 6 and 7, Former Oakland Army Base, Oakland, California* (“Phase II Investigation Report”; EKI, 2003d). These Phase II investigations by OBRA were completed in coordination with, and reviewed by, DTSC.

4. OVERVIEW OF SITE INVESTIGATIONS AND REMEDIAL ACTIVITIES

The Site use history and descriptions of the nature and extent of chemical impacts to soil and groundwater at the Site is based upon the results of record reviews, sampling efforts, and remedial activities conducted at the Site on behalf of SPTCo, and more recently by OBRA. OBRA compiled the available environmental data from investigations conducted on behalf of SPTCo into an electronic database that is included with the Phase II Investigation report (EKI, 2003d). See Section 5 for a description of the types of data included in the electronic database.

4.1 INVESTIGATION AND REMEDIATION ACTIVITIES CONDUCTED ON BEHALF OF SPTCO

On behalf of SPTCo, three phases of soil and groundwater investigations were conducted between 1991 and 1993 at the portion of the Site impacted by ASI's vehicle solvent washing operations, i.e., the "kerosene release area" (SP Environmental Systems, Inc., 1991; Industrial Compliance, 1992, 1993). The primary objective of these investigations was to determine the vertical and lateral extent of hydrocarbons in soil and groundwater at the kerosene release area. Soil and groundwater samples were analyzed for total petroleum hydrocarbons ("TPH") as kerosene ("TPHk"), TPH as gasoline ("TPHg"), TPH as diesel ("TPHd"), benzene, toluene, ethylbenzene, and total xylenes ("BTEX").

A total of 47 soil boreholes on behalf of SPTCo were advanced through the subsurface to groundwater during the investigations, and soil and groundwater samples were collected from each of the boreholes. The investigations also included collecting surface soil samples, and constructing and sampling groundwater monitoring wells. The locations of these historic boreholes and groundwater monitoring wells are depicted on Figure 2. The results of the investigations by SPTCo's consultant indicated that approximately 2,000 cubic yards of soil and groundwater in the immediate vicinity of the impacted soil was impacted with TPHk (Industrial Compliance, 1993).

In accordance with a work plan approved by Alameda County Environmental Health Department (Industrial Compliance, 1994c), SPTCo demolished the on-Site structures, including the "Auto Detailing Building", the "Carwash Trough", the "Undercoat Building", and the "Above Ground Storage Tank Area" associated with ASI's vehicle solvent washing operations, excavated kerosene-impacted soil, and disposed of the soil off-Site (Terranext, 1996). Although investigations by SPTCO prior to remediation estimated that only 2,000 cubic yards of kerosene impacted soil were present,

approximately 13,000 cubic yards of visually impacted soil and soil containing TPHk above the cleanup objective of 100 mg/kg were actually excavated because the volume of contaminated soil identified during the excavation was greater than the investigations indicated. Impacted soils were removed to the satisfaction of the RWQCB (RWQCB, 1996). The approximate limits of the excavation are depicted on Figure 2.

In the process of remediating the Site, SPTCo also abandoned groundwater monitoring wells in the area of excavation, collected and analyzed confirmation soil samples from the sidewalls and bottom of the excavations, backfilled the excavations with imported soil and overburden soil with less than 100 mg/kg of TPHk, constructed and developed monitoring wells for post remediation groundwater monitoring, and paved and restored the Site (Terranext, 1996). Four quarters of post remediation groundwater monitoring indicated that TPHk concentrations in groundwater were less than the detection limit of 50 µg/L within the former excavation boundaries and around the perimeter of the excavation. SPTCo's consultant concluded that the removal of impacted soil below the groundwater table, in conjunction with dewatering activities, reduced the concentrations of TPHk in groundwater (Terranext, 1996). Following closure of the Site by the RWQCB (1996), the groundwater monitoring wells were demolished by SPTCo.

4.2 PHASE II INVESTIGATION CONDUCTED ON BEHALF OF OBRA

On behalf of OBRA, EKI conducted a screening-level, Phase II environmental site assessment, also referred to as a Phase II Investigation, on the Site in May through August 2003, in accordance with a Work Plan and associated Work Plan Addendums (EKI, 2003a, 2003b, 2003c) reviewed and accepted by DTSC. The primary objective of the Phase II Investigation was to provide soil and groundwater data at areas of the Site with historical uses that could potentially impact soil or groundwater with COCs. A detailed description of the sampling objectives, sampling methods, and analytical results are described in the Phase II Investigation Report dated 12 September 2003 (EKI, 2003d) reviewed and accepted by DTSC.

4.3 SUMMARY OF CHEMICAL RELEASE SITES AND LOCATIONS

Based on the available historic information, SPTCo investigation and remediation reports, and the results of OBRA's Phase II Investigation of the Site, residual contamination of soil and groundwater on the Site appears to be relatively minor. The most significant, previously documented soil contamination at the Site resulted from the kerosene spills described in SPTCo reports. However, this kerosene spill area was remediated to the satisfaction of local and State agencies in the mid-1990s, and remaining detected concentrations of TPHk and other COCs in soil and groundwater are less than

the risk-based Remediation Goals for the Site established in the DTSC-approved RAP and summarized in Section 7 of this RAP Amendment.

As described in the Phase II Investigation Report, other areas were subject to screening-level investigations where COCs may have impacted soil or groundwater and included the soil stockpiles, former railroad spurs, areas with historical stains and debris piles observed on aerial photographs, a former vehicle maintenance area, storm drains and sanitary sewers, and surface soil potentially contaminated from aerial deposition from nearby highways and railroads. Focused sampling in these areas is described in the Phase II Investigation Report. Based on the Phase II Investigation Report of former Parcels 6 and 7 prepared by EKI on behalf of OBRA, and on review of available historic information, no locations that would be considered “RAP Sites” or “RMP Locations” by DTSC have been identified at the Site (EKI, 2003d).

RAP Sites are areas that have been investigated and characterized for release of hazardous substances and for which remediation is ready to proceed following the issuance of the DTSC-approved RAP. There are seven RAP Site at the Former OARB – EDC Area. The RMP Locations are areas with known or potential contamination, which may not yet have been fully investigated or characterized, any may be remediated during the course of planned redevelopment at the Site. RMP Locations include underground storage tank locations, vehicular maintenance sites, railyard, and other hazardous materials and/or petroleum handling areas (EKI, 2002a, 2002b).

As reported in the Phase II Investigation Report (EKI, 2003d), the remaining detected maximum COC concentrations in soil are 1,700 mg/kg for both kerosene and diesel, 9.2 mg/kg for arsenic, 160 mg/kg for lead, and polychlorinated biphenyls Aroclor-1260 at 0.76 mg/kg. The maximum COC concentrations in groundwater are 1,000 µg/L for kerosene, 1,000 µg/L for diesel, 15 µg/L for arsenic, and 2,300 µg/L for manganese. These COC concentrations are less than the risk-based Remediation Goals for the Site established in Section 7 of this RAP Amendment. Such risk-based Remediation Goals are based on an industrial / commercial land use scenario with the same exposure parameters as provided in the DTSC-approved RAP.

In the samples collected by EKI, lead was detected in one out of the 21 surface soil samples at 1,800 mg/kg at borehole SL-10. However, none of the additional surface or subsurface soil samples collected in the vicinity, or co-located with the sample containing elevated lead, contained lead at a concentration greater than 76 mg/kg, indicating that the lead detection of 1,800 mg/kg in surface soil at borehole SL-10 was an anomaly (i.e., a highly localized occurrence of elevated lead concentration).

In the event that the nature and extent of encountered COC releases, if any, are found to differ significantly from the conditions described in this RAP Amendment and OBRA's Phase II Investigation Report, the appropriateness of selected remedial actions adopted for the Site will be re-evaluated in consultation with DTSC. If the response measures contained in this RAP Amendment are judged to be inappropriate for any newly identified COC release locations, the Site owner will consult with DTSC to determine appropriate response actions. Newly identified COC releases would be identified through visual or olfactory observations. Additionally, although no additional soil or groundwater sampling is required, chemical data may be collected by the Site owner as may be necessary for off-site disposal purposes, or as directed by DTSC. If such new data indicate that COCs at concentrations greater than Remediation Goals are present in soil or groundwater at the Site, then the Site owner will consult with DTSC to determine appropriate response actions.

5. COC IDENTIFICATION

All chemicals detected in soil and groundwater at the Site, both historically and during OBRA's Phase II Investigation, were retained as COCs, except for analytical results of soil that was excavated as part of completed remedial activities, and other non-representative chemicals screened out following United States Environmental Protection Agency ("U.S. EPA") screening protocols, as described below and in Section 5 of the DTSC-approved RAP.

5.1 ASSESSMENT OF DATA QUALITY AND REPRESENTATIVENESS

EKI constructed an electronic database of available historic environmental sampling data for the Site. This electronic database is included in the Phase II report on compact disc (EKI, 2003d). This computerized database contains approximately 7,000 records of analytical results. The database for the Site includes analytical results from the following sources:

- Sampling data compiled by SP Environmental Systems on behalf of SPTCo in May 1991, associated with a Phase II Soil and Preliminary Groundwater Investigation conducted on the portion of former Parcel 7 subleased to ASI by SPTCo (SP Environmental Systems, 1991).
- Sampling data compiled by Industrial Compliance on behalf of SPTCo in April 1992, associated with a Phase II Investigation conducted on the portion of former Parcel 7 subleased to ASI by SPTCo (Industrial Compliance, 1992).
- Sampling data compiled by Industrial Compliance on behalf of SPTCo in February 1993, associated with a Supplemental Soil and Groundwater Investigation conducted on the portion of former Parcel 7 subleased to ASI by SPTCo (Industrial Compliance, 1993).
- Quarterly Groundwater Monitoring reports, prepared by Industrial Compliance and Terranext for 1st through 4th Quarter 1994, 1st Quarter 1995, 2nd Quarter 1995, and 4th Quarter 1995, on behalf of SPTCo (Industrial Compliance, 1994a, 1994b, 1995a, 1995b, 1995c, 1995d; Terranext, 1996).
- Sampling data compiled by Terranext on behalf of SPTCo in November and December 1994, associated with soil remediation and a ground water investigation (Terranext, 1996).

- Sampling data compiled by EKI on behalf of OBRA in May through August 2003, associated with the former Parcels 6 and 7 Phase II Investigation (EKI, 2003d).

The quality and representativeness of analytical results contained in the database for the Site were assessed to the extent possible prior to using the database to identify COCs; data collected by others could not be verified against laboratory analytical sheets as they were not always available. Based on the outcome of this assessment, certain analytical data were not considered in determining COCs because the analytical results were not pertinent or otherwise not representative of current environmental conditions of the Site. To preserve the integrity of the database, unless otherwise specified below, analytical results determined to be non-pertinent were not purged from the database; such non-pertinent data were flagged so that they can be easily identified in the future, if necessary. Examples of such flagged data are discussed below.

5.1.1 Inorganic Chemicals

Groundwater parameters (i.e., chloride, pH, salinity, sodium, sodium chloride, total suspended solids, and specific conductance) were flagged in the Site database. While such data may prove useful for evaluation of remedial alternatives or design of engineering controls, these data were not considered in the identification of COCs. For these data, a flag in the “comments” data field was set to “groundwater parameter.”

As discussed in the DTSC-approved RAP, many inorganic chemicals are major components of the Earth’s crust that are essential nutrients or trace elements present at normal crustal abundance levels, including aluminum, calcium, iron, magnesium, potassium, sodium, strontium, and titanium. Data on these inorganic chemicals were flagged as described above in the Site database.

5.1.2 Excavated Soil

Analytical results of soil that was excavated as part of completed remedial activities, which could be verified through review of the available documents, were flagged in the Site database. Analytical results of residual chemical concentrations in soil after excavation (i.e., confirmation samples) are considered representative and were not flagged in the database. A flag in the “comments” data field was set to “excavated” for analytical results of excavated soil. Analytical results were not flagged in the Site database if there was uncertainty regarding whether the sampled soil had been excavated.

5.1.3 Non-Representative Media

During remediation activities at the kerosene release area, overburden soil was stockpiled on-Site for potential reuse as backfill (Terranext, 1996). Two of the eight overburden soil stockpiles were found to be impacted with TPHk and were disposed off-Site. The analytical data from these two soil stockpiles disposed off-Site were not included in the Site database. The analytical data for the other six soil stockpiles, which were used to backfill the excavation, are included in the Site database. No sampling coordinates were included in the database for the backfill data, but the location of the stockpiled soil used for backfill is generally in the former kerosene-release excavation area.

5.2 COC IDENTIFICATION METHODOLOGY

Upon flagging non-pertinent data as described above, the Site database was evaluated to identify COCs. All chemicals detected above laboratory reporting limits in non-flagged soil and groundwater samples collected from the Site were retained as COCs. In addition, all chemicals identified as COCs in the DTSC-approved RAP were retained as COCs for the Site, such that Remediation Goals developed in the DTSC-approved RAP for COCs on the Former OARB - EDC Area apply to the Site in the event that such COCs are encountered in the future. Those chemicals that have not previously been detected above laboratory reporting limits on the Site, but which were retained as COCs because they have been detected in other areas of the EDC Area, are noted in the tables. TPHk is also included as a COC for the Site. COCs in soil and groundwater for the Site are listed in Tables 1 and 2, respectively.

6. APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

The purpose of this RAP Amendment is to adopt the technology evaluations, remedial alternatives, and selected remedies developed in the DTSC-approved RAP for the Site. The remedial alternatives and selected remedies developed in the RAP Amendment are protective of human health and the environment, cost-effective, and consistent with planned reuse of the Site. The process of developing remedial alternatives and remedies is described in Sections 8, 9, and 10 of the DTSC-approved RAP.

Part of the process in developing remedial alternatives and protocols includes an evaluation of Applicable or Relevant and Appropriate Requirements (“ARARs”), as was done in the DTSC-approved RAP. The ARARs that apply to the Former OARB - EDC Area, as evaluated in Section 6 of the DTSC-approved RAP, also apply to the Site. Table 6-1 of the DTSC-approved RAP summarizes the ARARs relevant to the former OARB and to the Site (EKI, 2002a). In addition, the requirement for the land use covenant, California Code of Regulations, Title 22, section 67391.1, will be satisfied by the execution and recording of the Covenant, which shall be substantively the same as Appendix A to this RAP Amendment, in conjunction with transfer of the Site.

7. REMEDIAL ACTION OBJECTIVES AND RISK-BASED REMEDICATION GOALS

The Remedial Action Objectives (“RAOs”) and risk-based Remediation Goals established for the Former OARB - EDC Area in the DTSC-approved RAP are adopted for the Site. These RAOs and Remediation Goals were developed with consideration of potentially complete exposure pathways, as well as chemical-specific ARARs. The RAOs for soil and groundwater are described in detail in Section 7 of the DTSC-approved RAP. The calculations of the risk-based Remediation Goals to achieve the specific RAOs, including equations used and input parameters, are described in Sections 7.3 to 7.5 of the DTSC-approved RAP. Remediation Goals for each COC for application at the Site are taken from the DTSC-approved RAP and are listed in Table 3 of this RAP Amendment.

Remediation Goals for most COCs identified at the Site are risk-based Remediation Goals that are the lowest calculated values of the non-carcinogenic or carcinogenic risk goal for each COC that are protective of all potentially exposed populations as identified previously in the DTSC-approved RAP. As noted in the tables, a chemical-specific ARAR or To-Be-Considered criterion was adopted as the remediation goal when it proved more stringent than the calculated human health risk-based Remediation Goals. The individual Remediation Goals in Table 3 represent the maximum allowable concentrations for the respective COCs, determined according to protocols described in the DTSC-approved RAP.

As noted in Table 3, the Army’s Fuel Storage Tank Sites Cleanup Levels for the Former OARB - EDC Area (IT, 2000a) are adopted as the site-specific Remediation Goals for petroleum hydrocarbons in soil and groundwater at the Site, as described in the DTSC-approved RAP. With respect to TPHk, rather than calculate risk-based Remediation Goals for TPHk in soil and groundwater, the Remediation Goals for TPHg in soil and groundwater established in the DTSC-approved RAP are conservatively adopted in this RAP Amendment as the site-specific Remediation Goals for TPHk, as presented in Table 3. In terms of mobility, volatility, and number of carbons per molecule, TPHk is generally considered an intermediate organic compound between TPHg and TPHd. The soil and groundwater Remediation Goals for TPHg are more stringent than those established in the DTSC-approved RAP for TPHd; thus, adoption of the TPHg Remediation Goal for application to TPHk for the Site is considered conservative and sufficient for protection of human health and the environment.

8. IDENTIFICATION, SCREENING, AND SELECTION OF REMEDIAL ALTERNATIVES

Following Comprehensive Environmental Responsibility, Compensation, and Liability Act (“CERCLA”) methodologies in U.S. EPA (1998) *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*, a range of remedial technologies and alternatives were identified and screened, pursuant to NCP regulation, 40 C.F.R. part 300.430(e)(7), against the following three criteria: effectiveness; implementability; and cost. Once the remedial alternatives were screened, a detailed analysis consisting of an assessment of individual alternatives against each of the nine NCP evaluation criteria was performed, as described in detail in Section 10 the DTSC-approved RAP.

8.1 IDENTIFICATION AND SCREENING OF ALTERNATIVES

8.1.1 No Action Alternative

- **No action for soil and groundwater:** The no action alternative for soil and groundwater is not retained for further analysis because it will not protect human health and the environment and maintain protection over time.

8.1.2 Action Alternatives

- **Conduct a Remedial Investigation and prepare a separate Remedial Action Plan including an evaluation of its own RAOs, remediation goals, and remedial alternatives:** This alternative is not retained for further analysis because the contiguous property was evaluated in a DTSC-approved RAP and the contiguous property shares similar past uses as well as types and concentrations of potential COCs with the Site. The DTSC-approved RAP evaluated RAOs, remediation goals, and remedial alternatives in a site-specific, robust manner that is applicable to the Site. Amending the DTSC-approved RAP is convenient and efficient for selecting remedies for the Site that are protective of human health and the environment due to the similarities of past land uses and planned future land uses between the Subaru Lot and the Former OARB – EDC Area.
- **Amend the existing DTSC-approved RAP and evaluate the remedial alternatives retained for detailed analysis in the RAP Amendment:** This alternative is retained for further detailed analysis.

8.2 DETAILED ANALYSIS OF ALTERNATIVES

The following individual remedial alternatives were retained from the original, DTSC-approved RAP for a detailed analysis. For this RAP Amendment, an analysis was performed consisting of an assessment against each of the nine NCP evaluation criteria, as described in detail in Section 10 the DTSC-approved RAP. The following is a summary of the results of the detailed analysis:

Excavate, conduct ex-situ immobilization, dispose of soil off-site, and monitor groundwater: This alternative is retained but not selected because identified COCs concentrations in soil and groundwater at the Site are less than Remediation Goals.

Excavate and dispose of soil off-site and perform in-situ treatment of shallow water-bearing zone and monitor groundwater: This alternative is retained but not selected because identified COCs concentrations in soil and groundwater at the Site are less than Remediation Goals.

Excavate and dispose of soil off-site, and monitor groundwater as needed: This alternative is retained but not selected because identified COCs concentrations in soil and groundwater at the Site are less than Remediation Goals.

Install vapor barrier with sub-slab depressurization system beneath new buildings and monitor groundwater: This alternative is retained but not selected because identified COCs concentrations in groundwater at the Site are less than Remediation Goals.

Install vapor barrier beneath new buildings and monitor groundwater: This alternative is retained but not selected because identified COCs concentrations in groundwater at the Site are less than Remediation Goals.

Perform in-situ bioremediation in shallow water-bearing zone and monitor groundwater: This alternative is retained but not selected because identified COCs concentrations in groundwater at the Site are less than Remediation Goals.

Perform chemical oxidation / reduction in shallow water-bearing zone and monitor groundwater: This alternative is retained but not selected because identified COCs concentrations in groundwater at the Site are less than Remediation Goals.

Monitored natural attenuation: This alternative is retained but not selected because identified COCs concentrations in groundwater at the Site are less than Remediation Goals.

Institutional controls: This is the selected alternative for the Site because although no COCs have been identified at concentrations in soil and groundwater at the Site above Remediation Goals, the Remediation Goals are not suitable for unrestricted land use. The Remediation Goals were developed considering a set of potentially complete exposure pathways recognizing that all remedial actions would include institutional controls alone to limit land use and groundwater extraction and use, or in combination with engineering controls, to ensure that exposure of Site occupants and workers under planned commercial and industrial land uses does not take place above the risk-based objectives, as established in the DTSC-approved RAP.

8.3 SELECTED REMEDY

The proposed remedy for the contamination at the Site is amending the existing DTSC-approved RAP to include the Site in the DTSC-approved RAP, and then selecting an appropriate remedy from among those identified in the DTSC-approved RAP. The appropriate remedy proposed for the Site is institutional controls, which will be in the form of a Covenant. The Covenant will include the following environmental restrictions and Implementation and Enforcement Plan requirements:

8.3.1 Environmental Restrictions

- Sensitive land uses, including, but not limited to, residential housing, schools for persons under 18 years of age, day-care facilities for children, hospitals, and hospices are prohibited. Reuse of Site soil outside of the Site boundary for any purpose is permitted only with the written approval of DTSC.
- The construction of groundwater wells and extraction of groundwater from new and/or existing wells for any purpose are permitted only with the written approval of DTSC. Construction dewatering activities are permitted subject to all applicable local and State requirements, including those of the California Regional Water Quality Control Board, for disposing of the liquid from dewatering activities.

8.3.2 Implementation and Enforcement Plan

All current and successive property owners shall comply with the Implementation and Enforcement Plan which includes the following requirements:

- A written report shall be submitted to DTSC annually. The report submittal date shall be within thirty (30) days following the anniversary date of the initial property transfer. The report shall include: (1) inspection results, (2) a certification attesting to the compliance of the terms and conditions of the Covenant, and (3) a discussion on any dewatering activities and final disposition of the liquid, violations of the Covenant, and any action taken to ensure compliance with the Covenant.
- DTSC shall be provided with reasonable right of entry and access to the property for periodic inspections to ensure compliance with the Covenant.

8.3.3 Justification for the Selected Remedy

The remaining detected maximum COC concentrations in soil and groundwater are below the Remediation Goals established for industrial / commercial land use; however, the concentrations are not protective for unrestricted land use by sensitive populations. By requiring environmental restrictions and an Implementation and Enforcement Plan, the institutional controls selected in this RAP Amendment will be protective of human health and the environment under an industrial / commercial land use scenario. The following table compares the remaining detected maximum COC concentrations with different health based benchmarks:

<u>COC in Soil</u>	<u>Maximum Detected Concentration mg/kg</u>	<u>Remediation Goal, mg/kg (a)</u>	<u>Residential Screening Level mg/kg (b)</u>
Kerosene	1,700	2,400	100
Diesel	1,700	2,400	100
Arsenic	9.2	20	0.39
Lead	160	750	150
PCB Aroclor 1260	0.76	1.8	0.22

<u>COC in Groundwater</u>	<u>Maximum Detected Concentration, µg/L</u>	<u>Remediation Goal, µg/L (a)</u>	<u>Potable Level, µg/L (c)</u>
Kerosene	1,000	7,280	100
Diesel	1,000	9,600	100
Arsenic	15	Unevaluated	0.045
Manganese	2,300	Unevaluated	880

- (a) The remediation goals are from Table 3 of this RAP Amendment.
- (b) The metal and PCB residential screening levels for soil are from U.S. EPA, Region IX, residential preliminary remediation goals (“PRGs”). The kerosene and diesel residential screening levels for soil are from the RWQCB Environmental Screening Levels (“ESLs”) assuming potable groundwater (U.S. EPA, Region IX, 2002; RWQCB, 2003).
- (c) The RWQCB’s ESLs are used for kerosene and diesel assuming the groundwater is potable. The U.S. EPA, Region IX tap water PRGs are used for arsenic and manganese.

On the basis of the results of OBRA’s Phase II Investigation, previous implementation of active remediation by prior tenants of the Army, and consultation with DTSC, implementation of the RMP, which is Appendix E of the DTSC-approved RAP, is not part of the selected remedy. However, in the event that the nature and extent of encountered COC releases at the Site are found to differ significantly from the conditions described in this RAP Amendment and in OBRA’s Phase II Investigation Report (EKI, 2003d), the appropriateness of selected remedial alternatives will be re-evaluated by the Site owner in consultation with DTSC. If the response measures contained in the DTSC-approved RAP are believed to be inappropriate for newly identified releases, the Site owner will consult with DTSC to determine appropriate actions.

9. REMEDIAL ACTION IMPLEMENTATION SCHEDULE

Once DTSC approves this RAP Amendment the Army will implement the remedy selected in this RAP Amendment through execution and recordation of the Covenant identified in Section 8. The Covenant will be executed and recorded as part of the transfer of the Site. It is intended that the selected remedy, institutional controls in the form of the Covenant, be the final remedy for the Site. Upon implementation of the final remedy, DTSC will determine whether all necessary remediation at the Site has been completed. Once that determination is made, DTSC will issue a certification letter to the Army concurring that the Army has completed all remediation on the Site. At that time, DTSC anticipates being able to concur with the FOST. The Army uses the FOST to document that all required remediation or other remedies have been implemented prior to transfer.

The Covenant will be recorded in the Alameda County Assessor's Office, run with the land, bind all owners of the land, their heirs, successors, and assignees, and the agents, employees, lessees, or renters of the owners, heirs, successors, and assignees. The Covenant will continue in perpetuity unless modified or terminated in accordance with applicable law.

10. NONBINDING ALLOCATION OF RESPONSIBILITY

On the basis of available information presented herein, there are no identified areas requiring additional active remediation on the Site. However, the imposition of institutional controls consisting of the land and groundwater use restrictions described in Section 8 is the selected remedial action for these parcels. As required by the California Health and Safety Code section 25356.1(e), which calls for a nonbinding preliminary allocation of responsibility, this section finds that the USAR and the Army are responsible for putting these institutional controls in place.

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Appendix A

Covenant to Restrict Use of Property – Environmental Restriction

Appendix B

Response to Comment